



## Manufactured Building

Wayne Goodwin, Commissioner of Insurance  
Rick McIntyre, Assistant State Fire Marshal

### MEMORANDUM

DATE: June 26, 2014

TO: Third Party Inspection Agencies, Building Officials, Modular Manufacturers, Modular Set-Up Contractors, and Other Interested Parties

FROM: C. Patrick Walker, P.E.  
Technical Services Manager -- Manufactured Building Division

RE: Excessive Floor Deflection – Modular Homes

Floor systems in modular homes are designed such that the maximum deflection allowed by the *NC Residential Code* is not exceeded. It is an unfortunate fact, however, that when sawn lumber floor joists (such as 2x8 or 2x10's) are used in the maximum spans allowed by the Code, the floor can have a "bouncy" feel *even though the maximum deflection allowed by the Code is not exceeded*. This situation is often remedied in the field by the addition of an intermediate girder beam, with piers, usually at the mid-point of the floor joists. Although the installation of such a system is *not a Code requirement*, it has always been position of the NC Department of Insurance that, if additional piers and girder beams are provided in the field, they must be constructed in accordance with the *NC Residential Code*. Please note the following items that will be required to insure Code compliance:

1. The home was approved without the intermediate pier and girder beam support. By installing an intermediate support system, the initially approved simple-span floor system design is being changed to a two-span continuous system. The added footing, pier, and girder beam intermediate support system must meet all of the requirements of the *NC Residential Code*.
2. Whenever the approved floor system is being altered in the field the local inspector must be notified. A new permit must be obtained from the local building official. All field work must be inspected and approved by the local building official.
3. Since the floor system as originally designed and approved is being changed, a North Carolina design professional must prepare sealed, job specific drawings to be submitted to the local building official when obtaining the required permit.
4. The consumer must be given a copy of the sealed, revised design drawings to maintain in their permanent home record file.
5. Footings:
  - a. Size of footings must meet the minimum size and thickness requirements of **Section R403, NC Residential Code**.
  - b. Drawings must state the minimum size footing area required, regardless of footing material used.
  - c. The depth of the footing must be 12" below grade or frost line, whichever is greater. If the home has a vented masonry crawlspace, the bottom of the footing may be at grade level. Notes to this effect must be placed on the drawings.

- d. If masonry footings are used, they must meet the requirements of **Section R407** of the **NC Residential Code**.
- e. ABS Pads are not specifically approved in the **NC Residential Code** or the **NC Building Code**. Therefore they are not allowed to be used in North Carolina for modular buildings unless North Carolina design professional sealed drawings on a site specific basis are approved by the local building official. See **Section 105, Alternate Material, Design or Methods** of the **2012 NC Administrative Code**.

6. Piers

- a. Drawings must indicate: Single stack minimum 8”x 8”x16” concrete block or adjustable metal pier.
- b. Concrete block piers must be bonded with fully grouted joints or surface bonding cement.
- c. Concrete block piers must meet the unsupported height and cap blocks requirements as per **Section R606.6, NC Residential Code**.
- d. Steel columns must meet the requirements of **Section R407, NC Residential Code**. If steel columns are used with ABS pads, the base plates must meet the minimum size requirements as noted on the ABS pad manufacturer’s installation instructions. This must be noted on the drawing.